

P019 Sumoylation dependent function of a T-box transcriptional repressor in *C. elegans*

Tanya Crum and Peter Okkema

Department of Biological Sciences, University of Illinois at Chicago

T-box transcription factors are crucial developmental regulators in all multicellular organisms, and they have not previously been associated with sumoylation. In *C. elegans*, the Tbx2 subfamily member TBX-2 is specifically required for formation of pharyngeal muscles induced in the ABa lineage. TBX-2 interacts with the E2 SUMO-conjugating enzyme UBC-9 and the E3 SUMO ligase GEI-17 in yeast 2-hybrid assays, and we have genetic evidence that TBX-2 function in *C. elegans* depends on sumoylation. Reduction of UBC-9 and GEI-17 activity by RNAi phenocopies *tbx-2* mutants and results in abnormal accumulation of a TBX-2::GFP fusion protein in sub-nuclear puncta. TBX-2 contains two consensus sumoylation sites, which are conserved in TBX-2 orthologs from related nematodes, and these sites mediate specific interactions with UBC-9 and GEI-17. TBX-2 also interacts with the Groucho/TLE family corepressor UNC-37 via an eh1 motif, and *unc-37(RNAi)* results in phenotypes similar to those resulting from loss of TBX-2 or UBC-9. We hypothesize TBX-2 functions as a UNC-37/Groucho-dependent transcriptional repressor, and this function requires sumoylation. Sumoylation sites and eh1 motifs are found in many T-box transcriptional repressors in *C. elegans* and other organisms, and we suggest function these T-box factors may similarly involve sumoylation and Groucho/TLE protein interaction.